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CHARACTERISTICS OF OWNERS OF THRIFT DEPOSITS IN COMMERCIAL BANKS AND SAVINGS & LOAN ASSOCIATIONS

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1. INTRODUCTION

Commercial banks and savings and loan associations offer quite similar products to consumers seeking a safe, liquid, yield bearing means of holding savings. Both institutions offer safety of principal (nearly all commercial banks and savings and loan associations now have federal deposit insurance), comparable liquidity, and convenient means of depositing large or small amounts; yet there have been marked shifts in the relative importance of the two institutions as repositories for consumer thrift funds.[1]

The recent spectacular growth of savings and loan associations and the decline in the relative importance of commercial banks as repositories for thrift funds has prompted major studies of the strengths and weaknesses of the two institutions.[2] Results of these studies indicate that commercial banks are at a competitive disadvantage because of some of their own operating conventions and certain policies of regulatory bodies. In addition, some of the studies suggest that aggressive marketing on the part of savings and loan associations and important changes in consumer preferences and perceptions have been instrumental factors in the shift of importance of the two institutions.

However, executives of commercial banks and savings and loan associations interested in improving the efficiency of their marketing activities, as well as individuals interested in the impact of the form and amount of consumer savings on purchasing behavior need more information on a disaggregative level about the

customers of the two institutions. For example, it is important to know if the customers of the two institutions come from similar or dissimilar consumer groups. If they have unique characteristics, fluctuations in economic conditions are likely to have differential effects on the flows of funds to the institutions. In addition, ascertainable distinct characteristics should lead to more precise definitions of market segments and more efficient allocation of marketing effort by the institutions.

On the other hand, since the assets are almost perfect substitutes, it is possible that the customers of the two institutions are indistinguishable in terms of standard socio-economic variables and the assets are used to fulfill similar roles in the portfolios of the two groups. However, even this condition does not preclude the possibility that significant differences exist in along important psychological dimensions. For example, both institutions have attempted to differentiate their images and, as a result, important differences may exist in customers' personality needs, motives for saving, and expectations of economic conditions. Knowledge of these differences, if they can be ascertained, should provide important insights into the factors that affect choice of financial intermediaries and have a significant impact on the promotional policies of the institutions.

In addition, disaggregative data direct from consumers will provide information about consumers who hold both SLA's and CBA's. This group is particularly interesting since there is an opportunity cost equal to the differential in interest rates on the funds held in CBA's and presumably there is some added inconvenience to holding funds in both institutions. It would be important to know if these individuals

allocate their funds equally to CBA's and SLA's, and if they concentrate proportionately more or less of their total funds to these institutions.

This kind of data can also be used to determine the relative effectiveness of the two institutions in exploiting the potential offered by their present customers.

1.1 Objectives

This paper is an attempt to provide information which can be used to test hypotheses and answer questions such as those listed above. In particular, the objectives are:

1) to provide new information about the role savings accounts in commercial banks and savings and loan associations play in the portfolios of the following three consumers groups:

> a) Group C - those who hold thrift deposits in commercial banks but not in savings and loan associations, b) Group S - those who hold thrift deposits in savings and loan associations and not in commercial banks, and c) Group B - those who hold thrift deposits in both commercial banks and savings and loan associations.

2) to identify characteristics which discriminate between Groups C, S, and B, and draw inferences relevant to the marketing policies of the respective institutions.

3) to determine the relative importance of different types of variables as discriminators between the three groups of consumers.

1.2 Design of the Investigation

1.2.1 The Sample

The sample utilized in this study (174 randomly selected savings units[3] who

were known to hold either CBAs or SLAs) was one of several panels drawn from large midwestern metropolitan areas in the study of consumer savings carried on by the Consumer Savings Project.[4]

As a part of the Consumer Savings Project, information was collected on a large number of variables, ranging from standard socio-economic variables to amounts held in specific assets and scores on psychological tests.

The data used in this study were taken from the third re-interview of the panel, approximately nine months after the initial contact. Corrections for inconsistencies in reporting during the nine month period and for discrepancies between the amount reported for a given holding and the actual amount according to the institution's records were made before any analysis was undertaken. These corrections mean that the data are likely to be more accurate than that obtained in most surveys. In particular, amounts reported for specific assets are far less likely to be biased by under- and non-reporting than are reports of financial holdings derived from most surveys.

1.2.2 Methodology

The first step in the analysis was classification of each savings unit in the sample into one of three mutually exclusive groups - Group C, Group S and Group B.

In the analysis of the role of the specific asset in the portfolio of the SU, comparisons were made of the mean dollar holdings in CBAs and SLAs and of concentration ratios in each of the respective assets. The concentration ratio was computed as the ratio of the amount held in the specific asset to the total discretionary assets[5] of the savings unit.

In the analysis of the importance of specific variables in discriminating between the three groups, comparisons between the means of each of the three groups were first made on a univariate basis, then all variables were included in a multivariate two-way discriminate analysis.[6]

The discriminate analysis was performed in a step-wise fashion. That is, in a given run the program took all included variables into account in the first step and computed the contribution of each of the variables to the total sum of the squares accounted for by the discriminant function. Then the variable contributing the least to the sums of squares was automatically deleted and the coefficients recomputed. This process, including the analysis of variance, was repeated until only one variable remained.

In order to compare the relative importance of certain classes of variables in discriminating between the three groups, all variables were classified in three categories - socio-economic, asset, and psychological variables. Socio-economic variables included the age, education, and occupation of the main wage earner in the SU; the SU's gross 1959 income and total discretionary assets held at the date of the interview - spring, 1960.

Asset balances included the SU's holdings in checking accounts, government bonds, annuities, loans lent, stock, bonds, equity in real estate other than the place of residence, and equity in businesses operated by the SU.

Psychological variables included were needs, as measured by the Edwards Personal Preference Schedule[7]; motives for saving; and expectations. The needs included were: N-achievement, N-deference, N-autonomy, N-affiliation, N-introspection, N-dominance, N-abasement, N-nurturance, N-change, N-aggression,

and N-heterosexuality. Motives included were: M-old age, M-education of children, M-payment of debts, M-purchase, and M-emergency. Expectations included were X-prosperity during the next five years, X-recession during next five years, X-price level to increase during next five years, X-price level to remain constant during next five years.

1.2.3 Limitations

Obvious limitations of the investigation are related to the nature of the sample. The sample was taken from:

one point in time - early 1960,
one geographic region - the midwest United States,
households in a large metropolitan area,
and households who are known holders of CBAs or SLAs.

Perhaps the most important limitation relates to the possible effect of promotion done prior to the study but not explicitly taken into account here. That is, the results found at this point in time may be in part caused by prior promotion. Thus, the variables which distinguish between the groups may not have generality in situations where other types of promotion have been employed. Obviously these limitations make it important to validate the results reported here with new data before making broad generalizations.

2. Results

2.1 Comparative Holdings of CBAs and SLAs

The data presented in Table 1 provide considerable information about the way the three consumer groups use CBAs and SLAs in their portfolios. In addition, inferences can be drawn about the nature of the market reached by the two institutions and their relative effectiveness in exploiting the opportunities presented by these

TABLE 1

Absolute and Relative Holdings in Commercial Bank Accounts and Savings and Loan Association Accounts

Group	Account	Average Balance $	Average Concentration %
C	CBA	2,980 (7,149)	55.9 (38.9)
S	SLA	6,229 (7,977)	51.2 (36.6)
B	CBA & SLA	7,670 (7,470)	56.5 (33.5)
	CBA	2,473 (3,048)	19.7 (20.5)
	SLA	5,198 (5,742)	36.8 (27.8)

markets.

For example, comparison of the average concentration ratios (i.e., $CBA or SLA % total discretionary assets) indicates that SUs in the three groups tend to hold, on average, slightly over 50% of their total discretionary assets in CBAs, SLAs, or a combination of the two. Although the variances of the three distributions are large, the similarity of the mean ratios is striking. Similar results are also found if the concentration of funds in the two assets is compared on a group basis. For example, 24% of the total discretionary assets of Group C is concentrated in CBAs, 27% of the assets of Group S is concentrated in SLAs, and 24% of the assets of Group B is concentrated in combination of CBAs and SLAs.

The fact that the aggregate concentration ratios are approximately one-half the value of the average of the individual ratios indicates, as might be expected, that a large number of those with small total asset holdings tend to have high concentration ratios. Thus, the results suggest that there is little difference in the portfolio role assigned to CBAs and SLAs by consumers who choose one or the other exclusively; and, contrary to a priori expectations, consumers who hold both CBAs and SLAs do not seem to concentrate more of their funds in these assets than those who choose one type of institution exclusively.

Viewed in a slightly different way, these results indicate that commercial banks have approximately the same effectiveness in exploiting the potential offered by SUs who hold CBAs exclusively, as savings and loan associations have with their present customers. However, the distribution of funds by SUs in Group B shows that the average concentration ratio for CBAs is approximately one-half of the same ratio for

SLAs. A similar result is found for the aggregate ratios, i.e., only 8% of Group B's total assets are in CBAs and 16% are in SLAs. Thus, with the group that diversifies thrift deposits between the two institutions, commercial banks do considerably less well than savings and loan associations.

Although the variances are large and the distributions skewed, the results shown in Table 1 also indicate that the average balance held in CBAs is considerably smaller than that held in SLAs. Moreover, since the denominator of the concentration ratio is total discretionary assets, it is apparent that the SUs in Group C have, on average, smaller savings to distribute among various alternatives. (Mean discretionary assets for the Groups C, S, and B are $11,814, $23,186, $32,372 respectively.) Thus, the results indicate that the commercial banks represented in this sample appear to attract proportionately more of the SUs with small savings and fewer SUs with large holdings than do savings and loan associations.

2.2 Characteristics of Holders of Thrift Deposits

The results of the preceding section indicate that there are close similarities in concentrations of funds in the two assets and there may be important differences in the financial capacity or potential of the three customer groups. In the following section the three groups are compared on all variables included in the study.

2.2.1 Univariate Comparisons of SU Groups

The means and standard deviations shown in Table 2 indicate that the head of

TABLE 2

Characteristics of Owners of Thrift Deposits

in Commercial Banks and Savings and Loan Associations

Variable	Group C Mean (N = 48)	Group S Mean (N = 72)	Group B Mean (N = 54)
Socio-Economic			
Age	45.9 (13.8)	52.7 [b] (11.6)	51.3 [c] (10.5)
Education	11.8 (3.8)	11.9 (3.9)	12.6 (3.6)
Size of S. U.	3.2 (1.4)	2.7 [a] (1.3)	2.5 [c] (1.1)
Income (1959)	6,270.83 (3,799.61)	6,159.72 (6,339.81)	7,564.81 (5,571.95)
Discretionary Assets	11,814.38 (35,183.34)	23,185.83 (33,130.84)	32,371.85 (75,998.35)
Professional	.27 (.06)	.18 (.04)	.26 (.06)
Self-employed	.12 (.05)	.14 (.04)	.07 (.04)
Clerical	.06 (.03)	.19 (.05)	.17 (.05)
Laborer	.44 (.07)	.26 [a] (.05)	.33 (.06)
Retired	.10 (.04)	.22 (.05)	.17 (.05)
Home owner	.87 (.05)	.90 (.03)	.81 (.05)
Assets			
Checking Account	864.17 (2,110.97)	722.50 (1,063.70)	1,459.26 (3,466.67)
Government Bonds	2,015.62 (8,602.57)	1,857.78 (4,126.58)	1,212.22 (2,403.89)
Annuities	193.54 (937.48)	281.94 (1,256.46)	519.26 (3,510.83)
Loans Lent	850.21 (2,887.61)	346.25 (1,350.29)	2,026.30 (7,879.27)
Stock	647.92 (2,400.55)	6,195.55 [a] (19,802.11)	7,752.96 (26,908.34)

TABLE 2 - Continued

	Group C Mean (N = 48)	Group S Mean (N = 72)	Group B Mean (N = 54)
Assets (Continued)			
Bonds	104.17 (714.13)	383.89 (2,096.18)	244.44 (1,169.15)
Home equity	8,396.67 (6,992.32)	12,690.42 [b] (9,654.69)	13,434.07 (15,084.30)
Real estate equity	3,312.92 (14,764.88)	5,088.06 (13,617.09)	3,901.85 (9,339.68)
Business equity	1,891.88 (8,923.98)	2,082.78 (12,363.20)	9,043.52 (50,410.33)
Psychological Needs			
Achievement	14.83 (3.31)	15.26 (3.58)	13.96 (4.73)
Deference	14.79 (3.70)	15.68 (3.84)	14.96 (3.76)
Autonomy	12.79 (4.40)	14.68 (4.35)	11.54 [d] (4.89)
Affiliation	13.90 (4.87)	15.38 (4.04)	15.85 (4.64)
Introspection	15.59 (3.09)	16.47 (4.80)	16.19 (4.83)
Dominence	14.66 (5.15)	15.06 (5.95)	15.50 (4.51)
Abasement	15.59 (4.00)	14.15 (4.77)	15.27 (4.70)
Nurturance	16.38 (4.98)	16.12 (4.67)	16.00 (4.34)
Change	13.83 (5.50)	14.41 (5.11)	14.08 (4.24)
Aggression	12.52 (5.67)	10.79 (4.10)	11.46 (5.31)
Heterosexuality	8.90 (6.38)	9.76 (7.08)	9.46 (5.51)
Motive for Saving			
Old age	.52 (.09)	.65 (.08)	.73 (.09)
Education of children	.38 (.09)	.24 (.07)	.27 (.09)

TABLE 2 - Continued

	Group C Mean (N = 48)	Group S Mean (N = 72)	Group B Mean (N = 54)
Motive For Saving (Continued)			
Payment of debts	.10 (.06)	.12 (.06)	.23 (.08)
Purchase	.28 (.08)	.38 (.08)	.38 (.10)
Emergency	.69 (.09)	.79 (.07)	.77 (.08)
Expectations			
Prosperity (Next Five Years)	.72 (.08)	.62 (.08)	.58 (.10)
Recession (Next Five Years)	.07 (.05)	.15 (.06)	.31 [c] (.09)
Price Level Increase (Next Five Years)	.86 (.06)	.76 (.07)	.73 (.09)
Price Level Constant	.14 (.06)	.15 (.06)	.27 (.09)

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a. Statistically significant difference between Group C & S at the .05 probability level.
b. Statistically significant difference between Group C & S at the .01 probability level.
c. Statistically significant difference between Group C & Group B at the .05 probability level.
d. Statistically significant difference between Group C & Group B at the .01 probability level.

a SU holding CBAs and not SLAs is more likely to be younger, employed as a skilled or unskilled laborer, and have more dependents living at home, than is the head of a SU holding SLAs and not CBAs. SUs in Group C also have less money invested in stocks and home equity. SUs in the two groups are remarkably similar in terms of formal education, income, home ownership, and checking account balances, expectations of economic and price conditions, and motives for saving. To the extent that CBAs and SLAs are held for the motives listed, the results indicate that both assets are indeed held for similar reasons. The differences in m-old age and m-education of children are consistent with the differences in the ages and family of the two groups, i.e., the younger group with larger families are less concerned with saving for old age, and more concerned with saving for education of children than the older, smaller family groups.

In general, differences in the same variables are found in comparing C with B, the major exception is in the expectation of a recession in the near future. Only 7 percent of Group C expected a recession, whereas 31 percent of Group B reported that expectation.

Group S was significantly different from Group B only in terms of the autonomy-need score.

In summary, univariate comparisons of the three groups indicate that Group C differs from Groups S and B on a limited number of dimensions and Group S is very similar to Group B on nearly all dimensions.

The fact that univariate comparisons fail to show many significant differences

(at least in a statistical sense) between the groups does not preclude the possibility that a multivariate model will yield highly significant differences. The multiple discriminant analyses described below is an attempt to overcome the limitations of univariate comparisons.

2.2.2 Multiple Discriminant Analysis between SU Groups

Group C vs. Group S - Table 3 provides a summary of the results obtained in the discrimination between holders of CBAs and SLAs using socio-economic, asset, and psychological variables.

Discriminant functions utilizing both socio-economic and psychological variables produced significant F ratios at the .05 probability level. However, the eight best psychological variables accounted for over 26 percent of the total variance and socio-economic variables accounted for less than 16 percent.[8]

The predication summary shows the results which were obtained in the attempt to predict a given SU's account ownership based on its characteristics and the coefficients derived in the discriminant function. For example, a discriminant value (Z) was calculated for each SU as a linear combination of the SU's psychological characteristics. On the basis of the SU's Z value and a separately calculated decision Z[9] the SU was classified in Group C or Group S.

These results also indicate that the psychological variables provide the greatest relative gain in correct predictions over a rational best guess. For example, if one knows only that 34 of the SUs are in Group S and 29 are in Group C, then the optimal prediction strategy -- guess that every SU is in Group S -- would result in 34/63 or

TABLE 3

Discrimination Between Owners of Commercial Bank Accounts and Owners of Savings and Loan Association Accounts, Based on Socio Economic, Asset and Psychological Variables

Analysis of Variance of the Discriminant Function

Variables	Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square	F
Socio-economic	Discriminant function	10	.1548	.4459	1.997 [a]
	Remainder	109	.8452	.2233	
Assets	Discriminant function	9	.1103	.3528	1.515
	Remainder	110	.8897	.2330	
Psychological	Discriminant function	8	.2652	.5189	2.437 [a]
	Remainder	45	.7348	.2130	

PREDICTION SUMMARY

	Predicted Correctly	Predicted Incorrectly	Total
Socio-economic			
Group C	33	15	48
Group S	49	23	72
Total	82	38	120
Assets			
Group C	35	13	48
Group S	40	32	72
Total	75	45	120
Psychological			
Group C	21	8	29
Group S	24	10	34
Total	45	18	63

a $P(F) < .05$

54 percent of the SUs placed in the correct ownership group. Utilization of the information obtained in the discriminant analysis resulted in 45/63, or 71 percent predicted correctly -- a gain of 17 percentage points. Utilization of the socio-economic and asset variables produced gains of 8 and 2.5 percentage points, respectively.

In an attempt to derive the "best" discriminant function the last six variables eliminated in each of the three previous functions were combined in a composite analysis. Table 4 shows the last eight variables to be eliminated from the composite function and the summary of the results.

The F value for the composite function is significant at the .01 probability level and over 36 percent of the variance was accounted for by the 8 variables listed in the table. Using these variables, the ownership of CBA's and SLA's was predicted correctly in 79 percent of the cases -- a gain of 25 percentage points.

Although average stock holdings was the last variable to be excluded in the stepwise analysis, at the eight variable step N-affiliation and clerical occupation made greater contributions to the explained sum of squares. Of the eight final variables five are from the psychological category, two are from the socio-economic category and one is from the asset category. This result is consistent with the results shown in Table 3; i.e., psychological variables tend to be better discriminators between SUs who own CBAs and not SLAs, and SUs who own SLAs and not CBAs, than other types of variables. This result is particularly interesting since univariate tests of the mean psychological scores failed to show any significant differences (at the .05 level). Yet when the same variables were used in a multivariate model, the end re-

TABLE 4

Discrimination Between Owners of Commercial Bank Accounts and Owners of Savings and Loan Association Accounts Based on the Best Eight Variables

DISCRIMINANT FUNCTION

Variable	Weight	Mean Z Group C	Mean Z Group S
Stock	-.00015 [c]	-2.27357	-2.63950
Clerical	-.42033 [d]		
N-autonomy	-.02762 [c]		
N-affiliation	-.04099 [d]		
N-heterosexuality	-.02358 [c]		
Age	-.01048 [b]		
N-achievement	-.03503 [c]		
M-old age	-.18896 [a]		

ANALYSIS OF VARIANCE

Source of Variance	Degrees of Freedom	Sum of Squares	Mean Square	F
Discriminant Function	8	.36592	.71588	3.90 [d]
Remainder	54	.63408	.18377	

PREDICTION SUMMARY

	Predicted Correctly	Predicted Incorrectly	Total
Group C	23	6	29
Group S	27	7	34
Total	50	13	63

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a $P(F) < .10$
b $P(F) < .05$
c $P(F) < .01$

sult is highly significant even after corrections for lost degrees of freedom.

An additional and perhaps more useful way to look at the predictive power of the discriminant function is to compute the probability of an individual SU falling in a given group, rather than making a binary prediction.[10]

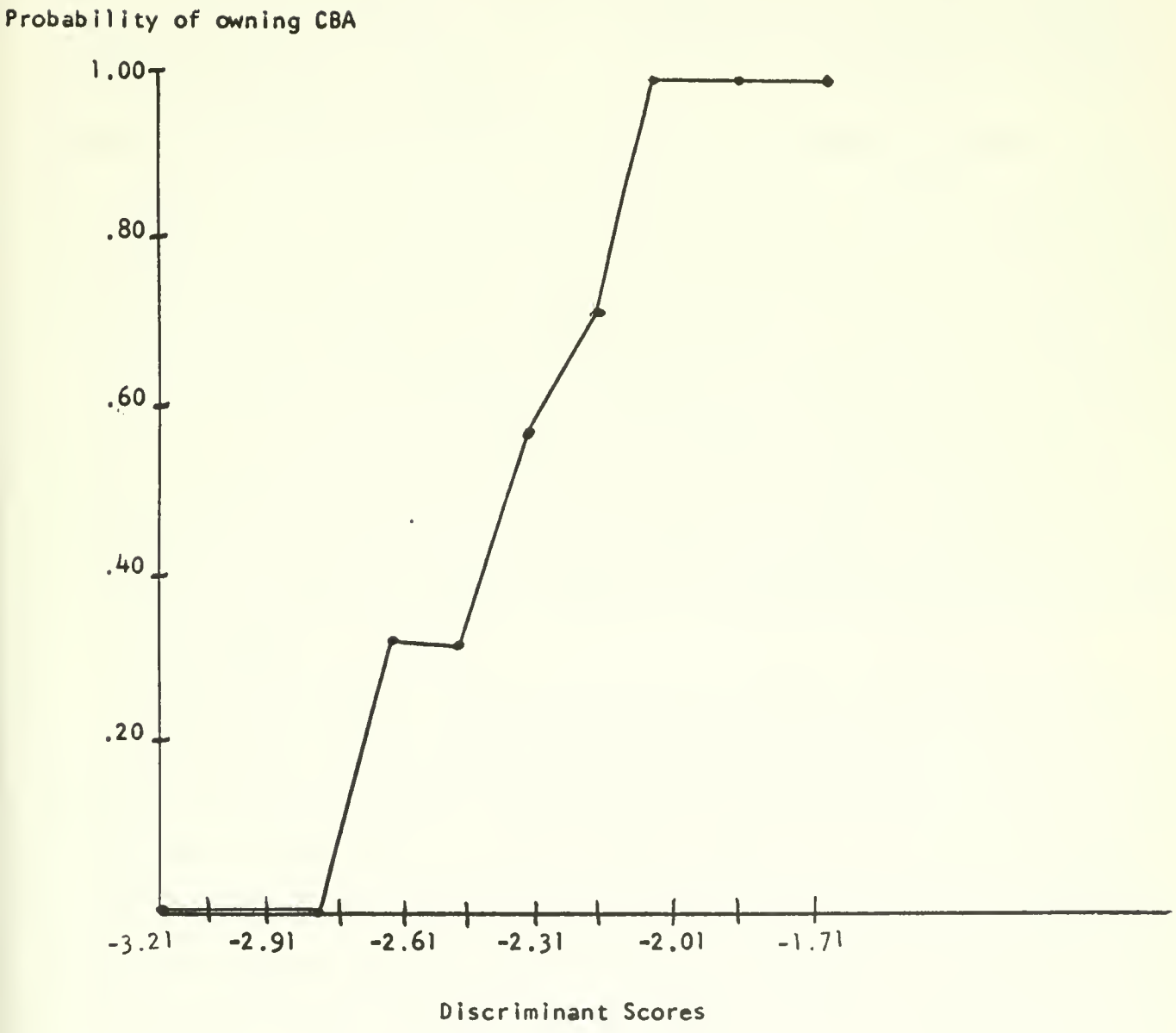
In this way the full information provided by the function is utilized. In order to compute the probability function the SUs' individual discriminant scores are grouped into discrete class intervals and the proportion of each class owning a given asset, say CBAs, is computed and plotted against the mid-point of the Z class interval. Figure 1, the probability function computed on the basis of the composite discriminant function, shows clearly that none of the SUs with Z scores of less than -2.76 owns thrift deposits in commercial banks, all of the SU's with Z scores greater than -2.16 own CBAs, and the probability of owning CBAs increases monotonically between the two limits.

This analysis also yields additional information. For example, since the Z value is positively associated with the probability of owning savings accounts in commercial banks and the coefficients for each of the variables in the function have negative signs, it is clear that high values of the variables are positively associated with the probability of owning SLAs and negatively associated with the probability of owning CBAs. That is, high needs for autonomy, affiliation, achievement, and heterosexuality are more closely associated with ownership of SLAs than with ownership of CBAs. Similarly, being older, having a clerical occupation, a motive of savings for old age, and large stock holdings are more closely related to SLA ownership than to CBA ownership.

FIGURE 1

Probability of Owning Commercial Bank Accounts

As a Function of Individual Discriminant Scores[a]



a Based on the best eight variables

It is important to note that this analysis does not provide information about the relationship of these variables and the amounts held in the two types of assets. Indeed, only $SLA and $stock ($r = .40$), and $SLA and age ($r = .29$) have simple correlation coefficients greater than .14. (Of course, multiple correlation analysis between dollar holdings and these variables may yield better results.)

In summary, the results of the discriminant analysis between holders of CBA's and SLA's indicated (1) that psychological variables seemed to be better predictors than most other variables in discriminating between the two groups, (2) the "best" model incorporated all three kinds of variables, and (3) the best (composite) model produced highly significant results (in a statistical sense) and marked gains in predictive ability. It remains to be seen whether these results are operationally significant, i.e., whether the same variables will predict the ownership of a different set of consumers.

Group C vs. Group B - The results shown in Table 5 are analogous to those reported in Table 3, except for the substitution of Group B for Group S. In contrast to the former case, socio-economic variables appear to produce more significant gains in predictive ability than do other types. Moreover, when the best six variables from each of the separate analyses are incorporated in the composite function, five of the last six variables to be eliminated were from the socio-economic class. Contributions to the explained variance by each of the five were highly significant (e.g., self-employed occupation, income, professional occupation, and education were all statistically significant at the 1 percent level.)

TABLE 5

Discrimination Between Owners of Commercial Bank Accounts Only and Owners of Both Commercial Bank Accounts and Savings and Loan Association Accounts, Based on Socio-economic, Asset and Psychological Variables

Analysis of Variance of the Discriminant Function

Variables	Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square	F
Socio-economic	Discriminant function	10	.2231	.5670	2.614[b]
	Remainder	91	.7769	.2169	
Assets	Discriminant function	9	.0886	.2503	.9941
	Remainder	92	.9114	.2517	
Psychological	Discriminant function	8	.25035	.42900	1.92[a]
	Remainder	46	.74965	.22341	

PREDICTION SUMMARY

	Predicted Correctly	Predicted Incorrectly	Total
Socio-economic			
Group C	35	13	48
Group B	36	18	54
Total	71	31	102
Assets			
Group C	37	11	48
Group B	38	26	54
Total	65	37	102
Psychological			
Group C	20	9	29
Group B	14	12	26
Total	34	21	55

a $P(F) < .10$

b $P(F) < .01$

TABLE 6

Discrimination Between Owners of Commercial Bank Accounts Only and Owners of Commercial Bank Accounts and Savings and Loan Association Accounts, Based on the Best Eight Variables

DISCRIMINANT FUNCTION

Variable	Weight	Mean Z Group C	Mean Z Group B
Self-employed	.65229 [c]	-.47914	-.84126
Income	-.00392 [c]		
Professional	.60868 [c]		
Education	-.06400 [c]		
Age	-.01460 [b]		
Government Bonds	-.00056 [a]		
N-achievement	.03707 [b]		
N-nurturance	.02723 [a]		

ANALYSIS OF VARIANCE

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square	F
Discriminant Function	8	.36212	.62054	3.26 [c]
Remainder	46	.63788	.19010	

PREDICTION SUMMARY

	Predicted Correctly	Predicted Incorrectly	Total
Group C	24	5	29
Group B	19	7	26
Total	43	12	55

a $P(F) < .10$
b $P(F) < .05$
c $P(F) < .01$

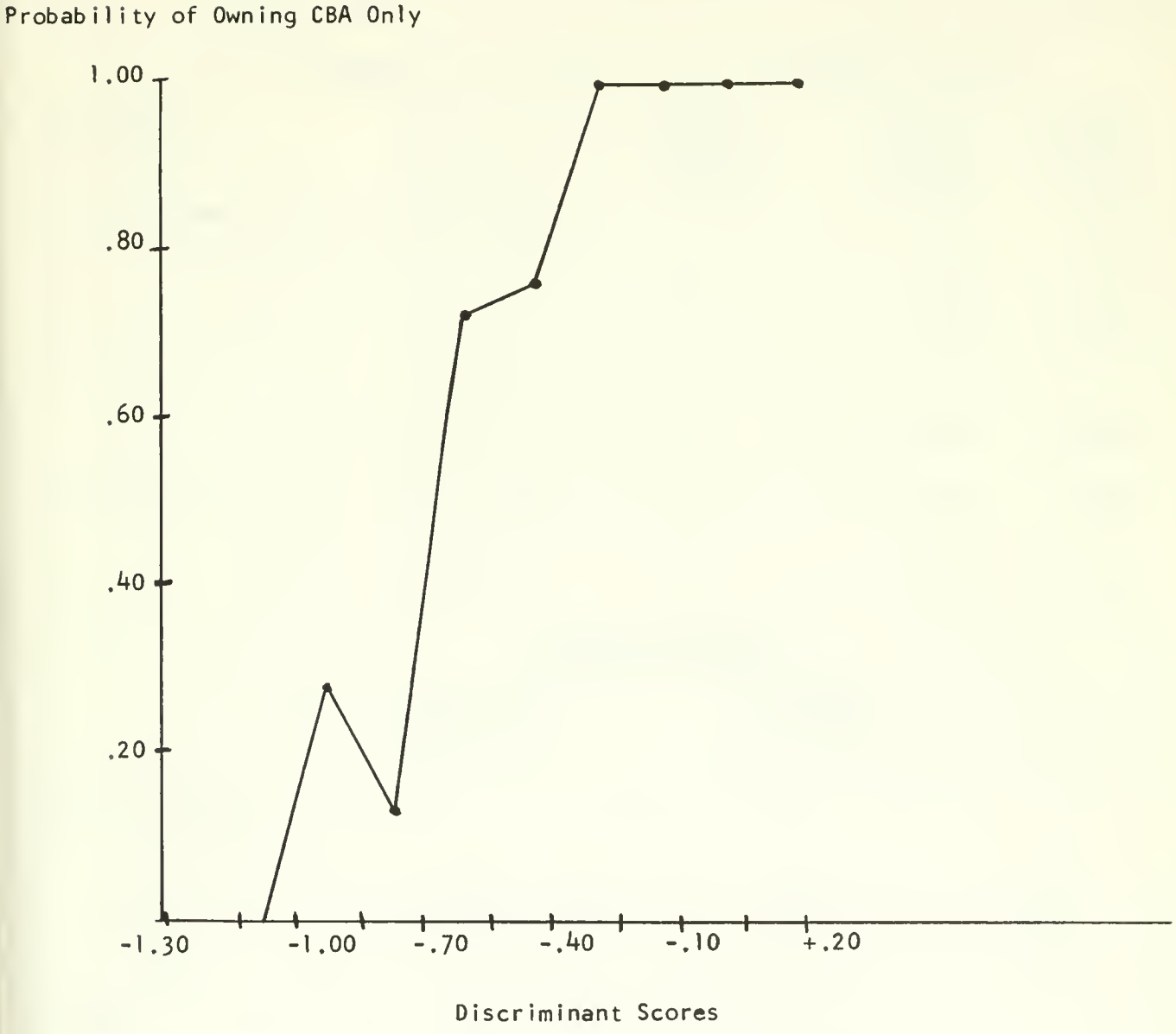
Z scores based on the coefficients derived for the best eight variables enabled correct ownership predictions to be made in 78 percent of the cases -- a gain of 25 percentage points over the "best guess" estimate. The probability function derived from the Z scores shows that the function offers perfect discrimination at the extremes and, with the exception of one class interval, the gradient increases monotonically between the extremes. The signs of the coefficients suggest that concentration of funds CBAs rather than diversification between CBAs and SLAs is positively associated with self employed and professional occupations and high needs for achievement and nurturance; and negatively associated with income, education, age, and government bond holdings.

Group S vs. Group B -- Separate discriminant functions computed for Groups S and B produced similar results to those found for Groups C and S. That is, psychological variables resulted in the greatest fraction of the variance accounted for -- 29 percent versus 8 percent for socio-economic variables and 7 percent for asset variables -- and the greatest gain in predictive power -- 27 percent versus 2 percent for socio-economic variables and 3 percent for asset variables. When the best variables from each category were combined in the composite analysis, all six of the psychological variables were still in the analysis at the eight variable step; and three of the most important psychological variables in the S vs. B analysis (N-autonomy, N-achievement, N-heterosexuality) are also discriminators between Groups C and S.

FIGURE 2

Probability of Owning Commercial Bank Accounts Only,

As a Function of Individual Discriminant Scores [a]



a Based on the best eight variables

TABLE 7

Discrimination Between Owners of Savings and Loan Association Accounts Only, and Owners of Both Commercial Bank Accounts and Savings and Loan Association Accounts, Based on Socio-economic, Asset, and Psychological Variables

Analysis of Variance of the Discriminant Function

Variables	Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square	F
Socio-economic	Discriminant function	10	.0872	.2690	1.098
	Remainder	115	.9128	.2449	
Assets	Discriminant function	9	.0659	.2260	.909
	Remainder	116	.9341	.2485	
Psychological	Discriminant function	8	.2924	.5514	2.725
	Remainder	51	.7006	.2023	

PREDICTION SUMMARY

	Predicted Correctly	Predicted Incorrectly	Total
Socio-economic			
Group S	40	32	72
Group B	34	20	54
Total	74	52	126
Assets			
Group S	54	18	72
Group B	22	32	54
Total	76	50	126
Psychological			
Group S	28	6	34
Group B	20	6	26
Total	48	12	60

a $P(F) < .05$

TABLE 8

Discrimination Between Owners of Savings and Loan Association Accounts Only, and Owners of Both Commercial Bank Accounts and Savings and Loan Association Accounts, Based on the Best Eight Variables

DISCRIMINANT FUNCTION

Variable	Weight		Mean Z Group S	Group B
N-autonomy	.04400	[e]	2.42479	2.10540
Self-employed	.31358	[c]		
N-achievement	.03560	[d]		
X-recession	-.25398	[c]		
N-nurturance	.03131	[d]		
Size of SU	.06113	[b]		
N-deference	.02747	[c]		
N-heterosexuality	.01102	[a]		

ANALYSIS OF VARIANCE

Source of Variance	Degrees of Freedom	Sum of Squares	Mean Square	F
Discriminant Function	8	.31938	.58820	2.99 [e]
Remainder	51	.68062	.19662	

PREDICTION SUMMARY

	Predicted Correctly	Predicted Incorrectly	Total
Group S	26	8	34
Group B	21	5	26
Total	47	13	60

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a $P(F) < .50$

b $P(F) < .25$

c $P(F) < .10$

d $P(F) < .05$

e $P(F) < .01$

It is interesting to note that the composite function produced virtually no gain in the variance accounted for or in correct predictions over that obtained using the function with psychological variables. In fact, one less SU was predicted correctly in the former analysis.

The probability function computed from the individual Z scores shows that Z is positively associated with the probability of concentrating funds in SLAs. However, the function shown in Figure 3 does not approach and remain at the upper limit as does the function for C and S, and C and B. That is, all SUs with Zs between 2.55 and 2.70, and 2.85 and 3.00 own SLAs only; while only one third of those with Zs between 2.71 and 2.85 own both SLAs and CBAs.

The signs of the coefficients show that high scores on n-autonomy, n-achievement, n-nurturance, and n-difference, n-heterosexuality are all more closely related to ownership of SLAs only than to ownership of both assets. Only the expectation of recession in the near future is more closely associated with diversifying funds in both assets than with concentration of funds in SLAs.

3. Summary and Conclusions

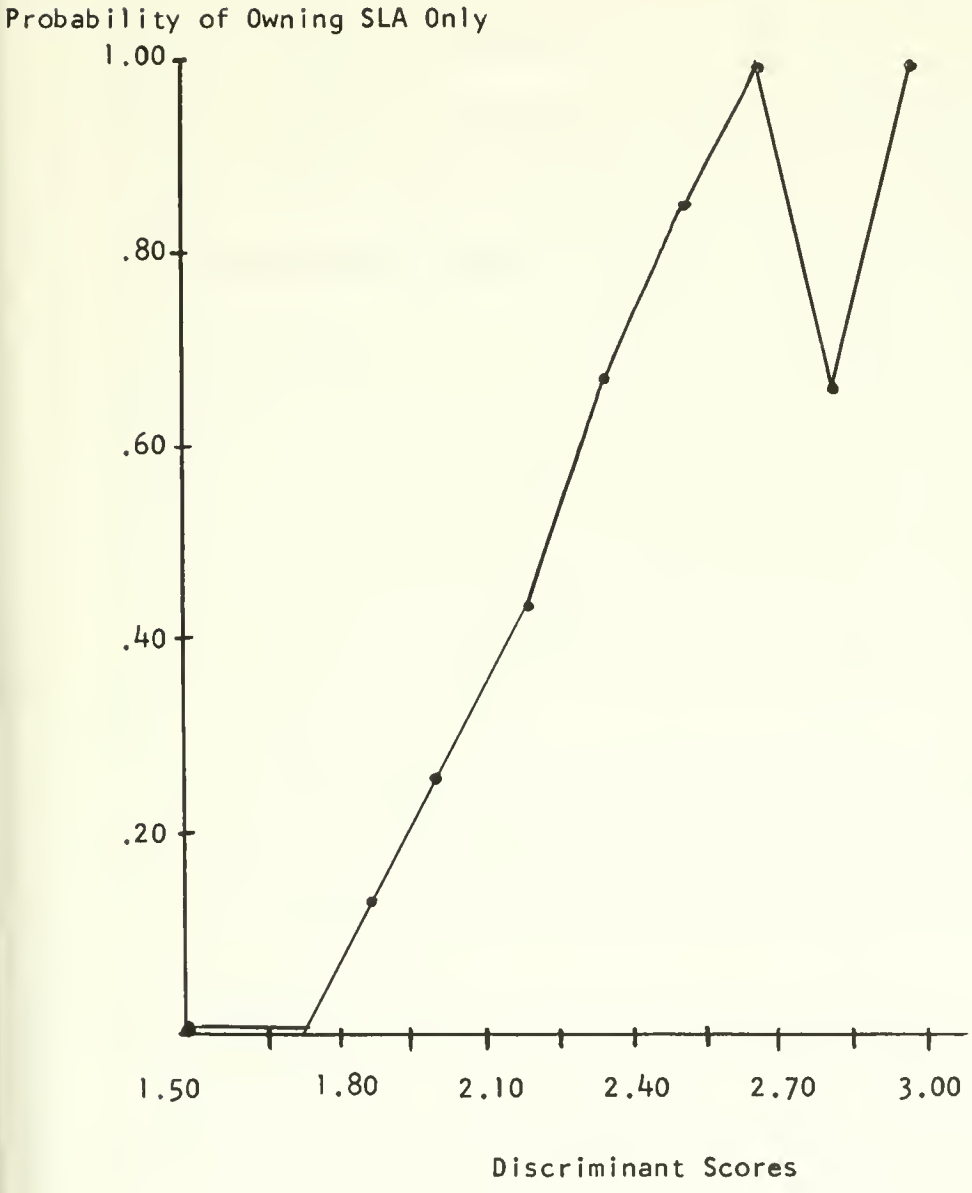
The results presented above provide at least first level answers to many of the questions raised in the introductory section.

First, it is clear that commonly used variables such as income, education, and home ownership are of little value in discriminating between consumer groups who concentrate thrift deposits in commercial banks and those who choose savings and loan associations. Age and clerical occupation may be viewed as exceptions since

FIGURE 3

Probability of Owning Savings and Loan Association Accounts Only,

As a Function of Individual Discriminate Scores [a]



a Based on the best eight variables

both proved to be important factors in the final discriminant function. Thus, the hypothesis about the homogeneity of the two groups in terms of standard marketing variables is partially supported by the results of the analysis.

It also seems clear that there are empirically verifiable psychological differences between the two groups which can be obtained with an easily administered pencil and paper test. This result has important implications for the marketing strategy of the institutions. If the differences in the needs found in this analysis are general it should be possible for marketing executives of the institutions to design promotional messages to more effectively cultivate possible inherent advantages. For example, the need for autonomy seems to be particularly closely associated with concentrating funds in SLAs.

Even if the needs found important here do not have generality in other situations, these results clearly indicate that it is possible for an institution to easily ascertain personality differences in consumer groups which may be closely associated with distinct market advantages.

It is important to note that none of the saving motives proved to be important discriminators between the two groups (saving for old age motive was not significant at the .10 probability level). Thus, the motives included in this study are, in the net analysis, no more closely associated with one type account than with the other. This result indicates that there may be little competitive advantage to be gained by an institution appealing directly to these motives.

The results also indicate that with the exception of stock holdings,

amounts held in other assets have little if any differential association with CBA's and SLA's. Thus, from a portfolio point of view, both assets seem to play similar roles. This result is consistent with the motives for saving results.

The results of the analyses involving Group B -- those who diversify their thrift deposits in both CBAs and SLAs -- present an interesting picture.

It is clear from Tables 6 and 8 that SUs in Group B are more like Group S than Group C in terms of concentrations of holdings and financial ability. Yet the most important variables in distinguishing between Group C and Group B are the more commonly used socio-economic variables and the most important discriminators between owners of SLAs only and Group B are psychological variables. Since owners of both CBAs and SLAs have low absolute holdings, as well as concentration ratios in commercial banks, these results indicate areas of important weaknesses. For example, income, education, age, and government bond holdings were all negatively associated with the probability of owning CBAs only.

Similar conclusions may be drawn from the results of the Group B-Group S discriminant analysis since savings and loan associations do less well, relatively speaking, with those who diversify than they do with those who hold only SLAs.

In summary, the results of this study indicate that certain psychological variables are important discriminators between owners of thrift deposits in commercial banks and savings and loan associations, but the best discriminant models require both psychological variables and standard socio-economic variables.

Although the evidence is less clear, because of the large variances and the

small sample size, there is evidence that both institutions do equally well in exploiting the opportunity presented by the customers who concentrate their thrift deposits, but savings and loan associations have a competitive edge with consumers who diversify their holdings.

The results found in the analysis of the concentration ratio's also strongly indicate -- as do the non-significant motives for savings -- that both assets play very similar roles in the portfolios of those that hold them.

Finally, it is the author's opinion that although the specific variables found significant here provide intriguing hypotheses to be tested in real world marketing experiments, showing that the most effective discriminate functions involve easily measured psychological variables is a more important result than determination of the specific variables in the function. For these results suggest that even simple tests may provide quantifiable personality dimensions which can be related to important marketing variables.

FOOTNOTES

1. See, "Flows Through Financial Intermediaries," Federal Reserve Bulletin, Vol. 50, No. 5, May, 1964, pp. 549-557

2. For example see, Clifton H. Creps, Jr., and David T. Lapkin, "Public Regulation and Operating Conventions Affecting Sources of Funds of Commercial Banks and Thrift Institutions," Journal of Finance, Vol. XVII, No. 2, May, 1962, p. 289;

   David Alhadeff and Charlotte P. Alhadeff, "The Struggle for Commercial Bank Savings," The Quarterly Journal of Economics, Vol. LXXII, February, 1958, No. 1, pp. 1-22.

   Marvin Rozen, "Competition Among Financial Institutions for Demand and Thrift Deposits," Journal of Finance, Vol. XVII, No. 2, May, 1962, p. 318.

3. A savings unit is defined as one or more persons living in the same dwelling pooling half or more of their income and savings. A dwelling unit may, therefore, have more than one savings unit.

4. The consumer savings project is a large-scale study designed to develop the methodology for collection of accurate financial information through the survey technique. See Robert Ferber, Collecting Financial Data by Consumer Panel Techniques, (Bureau of Economic and Business Research, University of Illinois, 1959).

5. Total discretionary assets was defined as the amount of SU's total savings minus equity in the home, checking account balances, currency, cash value of life insurance and present value of pension plans.

6. The two-way discriminate analysis is analogous to standard regression analysis in which the dependent variable is dichotomous. One can view the process as maximizing the deviation of the means of the two groups away from a discriminate function rather than attempting to minimize the deviations of the dependent variable away from a regression line. For a discussion of discriminant analysis see, R. A. Fisher, Contributions to Mathematical Statistics, (New York: John Wiley and Sons, Inc., 1950), pp. 184-90.

7. Alan Edwards, Edwards Personal Preference Schedule Manual, Revised, 1959, New York Psychological Corporation.

8. The psychological tests were administered to 50 per cent of the original sample who were randomly selected from the total. Tests made on key variable indicate that there are no significant differences between this sub-sample and the total.

9. The decision Z is calculated as follows: $Z_d = \frac{1}{2(\bar{Z}_c - \bar{Z}_s)} [\bar{Z}_c^2 - \bar{Z}_s^2 + 2\sigma_p^2 \log_e \frac{P_s}{P_c}$

Where: $\bar{Z}_c$ = mean discriminant score for Group C

$\bar{Z}_s$ = mean discriminant score for Group S

σ_p^2 = the pooled variances of the discriminant scores for each group

P_c = proportion of the observations in Group C

P_s = proportion of the observations in Group S

William W. Cooley and Paul R. Lohnes, Multivariate Procedures for the Behavioral Sciences (New York: John Wiley and Sons, Inc., 1962), pp. 117-18.

10. For an application of this technique in the prediction of innovative purchasing behavior see, Ronald E. Frank and William E. Massy, "Innovation and Brand Choice," (Paper presented at the American Marketing Association Winter Conference, Boston, Massachusetts, 1963).

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